

Remarks

Reconsideration of the application in view of the following remarks is respectfully requested. No claims have been amended. Claims 105, 107-112, 114, 116, 119-121, 123-128, 130, 132, 135, and 136 have been canceled. Claims 155-182 have been added. Claims 1-4, 7, 9-17, 19-28, 30-40, 42-52, 54-64, 66-76, 78-83, 85, 87-89, 91, 93-95, 97, 99-101, 103, 105, 107-112, 114-121, 123-128, and 130-182 are currently pending in the application.

In the Office Action, the Examiner rejected claims 1-4, 10-17, 20-22, 24, 27, 28, 31, 33, 34, 36, 39, 40, 43, 45-52, 55-58, 60, 63, 64, 67-70, 72, 75, 76, 79-83, 87-89, 93-95, and 99-101 under 35 U.S.C. §103(a) as being unpatentable over Rochberger et al. (U.S. Patent No. 6,272,107) in view of Wicklund (U.S. Patent No. 6,034,958). This rejection is respectfully traversed.

Independent Claim 1

As it stands, claim 1 recites:

A method for recovering from a failure in a network, comprising:
sending a first set of information from a source to a destination via a first route;
detecting a failure along said first route;
in response to said failure, directing a message to said source informing said source of said failure; and
in response to said message, sending a future set of information from said source to said destination via an alternate route;
wherein directing said message to said source comprises:
identifying said source;
accessing a routing table which comprises one or more routes to said source;
obtaining a return route from said routing table; and
sending said message to said source via said return route.

Claim 1 provides an advantageous method for recovering from a network failure. By identifying the source of a set of information and directing a message back to that source to inform it of a failure, the method makes it possible to recover from a failure much more quickly than in the prior art.

Such a method is neither disclosed nor suggested by Rochberger, taken individually. Instead, Rochberger discloses a method for recovering from a network failure in a connection-oriented network (specifically, an ATM network). In Rochberger, two paths (a primary path and a redundant path) are established between a source node and a destination node (Col. 7, lines 13-31; Figs. 2 and 3). Each path may include one or more transit nodes. When a break or failure is detected in the primary path (Fig. 15), the transit node on each side of the failure sends out a special cell to the end nodes (the source and destination nodes). Specifically, the transit node on the side of the break closer to the source node sends the special cell to the source node, while the transit node on the side of the break closer to the destination node sends the special cell to the destination node (Col. 5, lines 27-39; Col. 15, lines 55-65). This special cell indicates to the source node and the destination node that traffic should be rerouted from the primary path to the redundant path. In response to this special cell, the source node and destination node stop using the primary path and switch over to the redundant path. In this manner, the network detects and recovers from the failure.

While, like claim 1, Rochberger does deal with recovery from a network failure, it differs from claim 1 in a subtle but very significant way: unlike the method of claim 1 in which the source is identified as part of the process of directing a message (indicating the failure) back to the source, Rochberger does not identify the source node when it sends

the special cell to the source node. Instead, when the transit node sends the special cell to the source node, it simply sends the special cell back to the same port from which it received the data cell that could not be forwarded. This is shown in Fig. 17. Specifically, the source node sends a data cell to the input portion 310 of a first port. The switching fabric 312 of the transit node switches this cell to the input portion 316 of a second port. The data cell should thereafter travel from the input portion 316 of this port to the next transit node. However, because of the link failure (indicated by the large X), this is not possible. Thus, the switching fabric 312 redirects (as indicated by dashed line 313) the data cell and a special cell back to the output portion 314 of the first port (the same port on which the data cell was received). The special cell and data cell will thereafter be carried back to the source node.

Note from the above discussion that when the transit node sends the special cell to the source node, it does not identify the source node. Rather, it simply sends the special cell to the same port from which the data cell was received. There is no mention or suggestion whatsoever in Rochberger that the transit node identifies the source node. The reason that the transit node can send the special cell to the source node without identifying the source node is because the method of Rochberger is intended to be implemented in an ATM network (ATM is a connection-oriented transport service; see Col. 1, lines 57-63). In an ATM network, paths are pre-established using VPI/VCI inbound and outbound pairs (Col. 7, lines 49-61). Because paths are pre-established, it is not necessary to identify a source node to send a cell to that node. All that needs to be done is to send the cell along the proper pre-established path. Once that is done, the source node is guaranteed (barring another failure) to receive that cell. Thus, in

Rochberger, there is no need to identify the source node, and there is no mention or suggestion of doing so.

In contrast, the method of claim 1 may be implemented in a non-ATM network. In such a network, there may be no pre-established paths. In order to direct a message back to a source, it is necessary to identify that source. Only after the source is identified will it be possible to determine a route back to that source. Because the method of claim 1 identifies the source as part of directing a message (indicating a failure) back to the source, it can be implemented in any network, even ones in which paths are not pre-established. The method of Rochberger cannot. Because Rochberger fails to disclose or suggest identifying the source as part of directing a message (indicating failure) back to the source, Applicant submits that claim 1 is patentable over Rochberger, taken individually, for at least this reason.

Claim 1 is also patentable over Wicklund for at least this reason. There is nothing in Wicklund that discloses or suggests identifying a source as part of directing a message (indicating a failure) back to that source, and the Examiner has made no assertion that Wicklund discloses this aspect of claim 1. Thus, Applicant submits that claim 1 is patentable over Wicklund, taken individually, for at least this reason.

Even if the references were combined (assuming for the sake of argument that it would have been obvious to combine the references), the combination still would not produce the method of claim 1. As argued above, neither reference discloses or suggests identifying a source as part of directing a message (indicating a failure) back to the source. Thus, even if the references were combined, this aspect of claim 1 would still be

missing. For at least this reason, Applicant submits that claim 1 is patentable over Rochberger and Wicklund, taken individually or in combination.

Although the Examiner did not apply Hsing et al. (U.S. Patent No. 6,167,025) to claim 1, Applicant would like to discuss Hsing at this time to preclude the application of this reference in future office actions. In applying Hsing to other claims, the Examiner asserts that "Hsing et al disclose in Figure 18B a re-route message 1802 that includes a source switch identifier which identifies the source switch". While it is true that Hsing does use the source switch's identifier in some operations, Applicant notes that, unlike the method of claim 1, the source switch's identifier is not used as part of the process of directing a message (indicating a failure) back to the source switch. Instead, the source switch's identifier is used in setting up a new route. There is nothing in Hsing that discloses or suggests identifying the source switch for purposes of directing a message (indicating a failure) back to the source switch. Like Rochberger, the method of Hsing is implemented in an ATM network, and as discussed above, there is no need in an ATM network to identify the source switch before sending a message back to the source switch. As a result, this aspect of claim 1 is not disclosed or suggested by Hsing. Hence, Applicant submits that claim 1 is patentable over Hsing, taken individually or in combination with Rochberger and Wicklund.

Dependent claims 2-4 and 10

Claims 2-4 and 10 depend from claim 1, and recite further advantageous aspects of the invention. Applicant submits that claims 2-4 and 10 are patentable over

Rochberger and Wickland for at least the same reasons as those given above in connection with claim 1.

Independent claims 11, 21, and 33

Each of the independent claims 11, 21, and 33 recites a method for recovering from a failure. Each of these claims makes it clear that the method is implemented within a router, and each claim recites an "identifying" limitation similar to the "identifying" limitation of claim 1, except that the source is specified to be an ingress module. Applicant submits that these independent claims are patentable over Rochberger and Wicklund, taken individually or in combination.

First of all, as argued above in connection with claim 1, Rochberger and Wicklund, taken individually or in combination, fail to disclose or suggest identifying an ingress module as part of the process of directing a message (indicating a failure) back to the ingress module. Thus, claims 11, 21, and 33 are patentable over Rochberger and Wicklund for at least this reason.

In addition, Rochberger and Wicklund, taken individually or in combination, do not disclose or suggest a failure recovery method that is implemented within a router. Wicklund does not disclose a failure recovery method at all, and Rochberger only discloses a failure recovery method that is implemented on a network-wide basis. More specifically, the method of Rochberger is implemented between nodes (where each node may be viewed as a router). It is not implemented within a node. There is nothing in Rochberger that indicates that the method taught therein may be implemented within a node. For example, with reference to Fig. 18, there is nothing in Rochberger that

discloses that the failure recovery method can be implemented inside the source node 14 to recover from a failure in the switching fabric 322 or a failure of the port interfaces 324, 328 (egress modules). Thus, for at least this additional reason, Applicant submits that claims 11, 21, and 33 are patentable over Rochberger and Wicklund, taken individually or in combination.

Dependent claims 12-17, 20, 22, 24, 27, 28, 31, 34, 36, 39, 40, and 43

Claims 12-17, 20, 22, 24, 27, 28, 31, 34, 36, 39, 40, and 43 depend from claims 11, 21, and 33, and recite further advantageous aspects of the invention. Applicant submits that claims 12-17, 20, 22, 24, 27, 28, 31, 34, 36, 39, 40, and 43 are patentable over Rochberger and Wickland for at least the same reasons as those given above in connection with claims 11, 21, and 33.

Independent claims 47, 57, and 69

Independent claims 46, 57, and 69 are router claims which parallel the method claims of independent claims 11, 21, and 33, respectively. Applicant submits that claims 46, 57, and 69 are patentable over Rochberger and Wicklund for at least the same reasons as those given above in connection with claims 11, 21, and 33.

Dependent claims 47-52, 55-56, 58, 60, 63, 64, 67-68, 70, 72, 75, 76, and 79-80

Claims 47-52, 55-56, 58, 60, 63, 64, 67-68, 70, 72, 75, 76, and 79-80 depend from claims 46, 57, and 69, and recite further advantageous aspects of the invention. Applicant submits that claims 47-52, 55-56, 58, 60, 63, 64, 67-68, 70, 72, 75, 76, and 79-

80 are patentable over Rochberger and Wickland for at least the same reasons as those given above in connection with claims 46, 57, and 69.

Independent claim 81

Independent claim 81 recites a method implemented by a forwarding mechanism in a router, which includes an "identifying" limitation similar to the "identifying" limitation of claim 1, except that the source is specified to be an ingress module. As argued above in connection with claim 1, Rochberger and Wicklund, taken individually or in combination, fail to disclose or suggest identifying an ingress module as part of the process of directing a message (indicating a failure) back to the ingress module. Thus, Applicant submits that claim 81 is patentable over Rochberger and Wicklund, taken individually or in combination, for at least this reason.

Dependent claims 82-83

Claims 82-83 depend from claim 81, and recite further advantageous aspects of the invention. Applicant submits that claims 82-83 are patentable over Rochberger and Wickland for at least the same reasons as those given above in connection with claim 81.

Independent claim 87

Independent claim 87 is a claim for a forwarding mechanism in a router, which parallels the method claim of claim 81. Applicant submits that claim 87 is patentable over Rochberger and Wicklund for at least the same reasons as those given above in connection with claim 81.

Dependent claims 88-89

Claims 88-89 depend from claim 87, and recite further advantageous aspects of the invention. Applicant submits that claims 88-89 are patentable over Rochberger and Wickland for at least the same reasons as those given above in connection with claim 87.

Independent claim 93

Independent claim 93 recites a method implemented by an egress module in a router, which includes an "identifying" limitation similar to the "identifying" limitation of claim 1, except that the source is specified to be an ingress module. As argued above in connection with claim 1, Rochberger and Wicklund, taken individually or in combination, fail to disclose or suggest identifying an ingress module as part of the process of directing a message (indicating a failure) back to the ingress module. Thus, Applicant submits that claim 93 is patentable over Rochberger and Wicklund, taken individually or in combination, for at least this reason.

Dependent claims 94-95

Claims 94-95 depend from claim 93, and recite further advantageous aspects of the invention. Applicant submits that claims 94-95 are patentable over Rochberger and Wickland for at least the same reasons as those given above in connection with claim 93.

Independent claim 99

Independent claim 99 is a claim for a forwarding mechanism in a router, which parallels the method claim of claim 93. Applicant submits that claim 99 is patentable over Rochberger and Wicklund for at least the same reasons as those given above in connection with claim 93.

Dependent claims 100-101

Claims 100-101 depend from claim 99, and recite further advantageous aspects of the invention. Applicant submits that claims 100-101 are patentable over Rochberger and Wicklund for at least the same reasons as those given above in connection with claim 99.

In the Office Action, the Examiner rejected claims 7, 19, 30, 42, 54, 66, 78, 85, 91, 97, and 103 under 35 U.S.C. §103(a) as being unpatentable over Rochberger et al. in view of Grenier et al. (U.S. Patent No. 6,898,177) and further in view of Hsing et al. (U.S. Patent No. 6,167,025). This rejection is respectfully traversed.

Dependent claims 7, 19, 30, 42, 54, 66, 78, 85, 91, 97, and 103

As an initial matter, Applicant notes that Grenier is not a reference that has been made of record, and has not been discussed substantively by the Examiner. It appears that the Examiner may have referred to this reference in error, intending to cite Wicklund instead. Since the first rejection under 35 U.S.C. §103(a) cites Wicklund, which is a reference of record, Applicant is assuming that it is Wicklund, not Grenier, that is being applied in this rejection.

Dependent claims 7, 19, 30, 42, 54, 66, 78, 85, 91, 97, and 103 depend from independent claims 1, 11, 21, 33, 46, 57, 69, 81, 87, 93, and 99, respectively. If independent claims 1, 11, 21, 33, 46, 57, 69, 81, 87, 93, and 99 are patentable over Rochberger, Wicklund, and Hsing, then it follows that dependent claims 7, 19, 30, 42, 54, 66, 78, 85, 91, 97, and 103 are likewise patentable over Rochberger, Wicklund, and Hsing.

As argued above in connection with claim 1, none of the references, taken individually or in combination, disclose or suggest identifying a source as part of the process of directing a message (indicating a failure) back to the source. Thus, for at least this reason, Applicant submits that claim 1 is patentable over Rochberger, Wicklund, and Hsing, taken individually or in combination.

Each of the independent claims 11, 21, 33, 46, 57, 69, 81, 87, 93, and 99 recites an "identifying" limitation similar to the "identifying" limitation recited in claim 1, except that the source is specified to be an ingress module. Applicant submits that these independent claims are patentable over Rochberger, Wicklund, and Hsing for at least the same reasons as those given above in connection with claim 1.

Applicant further submits that dependent claims 7, 19, 30, 42, 54, 66, 78, 85, 91, 97, and 103, which depend from independent claims 1, 11, 21, 33, 46, 57, 69, 81, 87, 93, and 99, and which recite further advantageous aspects of the invention, are likewise patentable over Rochberger, Wicklund, and Hsing for at least the same reasons as those given above in connection with claims 1, 11, 21, 33, 46, 57, 69, 81, 87, 93, and 99.

In the Office Action, the Examiner rejected claims 9, 32, and 44 under 35 U.S.C. §103(a) as being unpatentable over Rochberger et al. in view of Grenier et al. (U.S. Patent No. 6,898,177) and further in view of Fedyk et al. (U.S. Patent No. 6,560,654). This rejection is respectfully traversed. Again, Applicant is assuming that it is Wicklund, not Grenier, that is being applied in this rejection.

Dependent claims 9, 32, and 44

Dependent claims 9, 32, and 44 depend from independent claims 1, 21, and 33, respectively. If independent claims 1, 21, and 33 are patentable over Rochberger, Wicklund, and Fedyk, then it follows that dependent claims 9, 32, and 44 are likewise patentable over Rochberger, Wicklund, and Fedyk.

As argued above in connection with claim 1, Rochberger and Wicklund, taken individually or in combination, fail to disclose or suggest identifying a source as part of the process of directing a message (indicating a failure) back to the source. This aspect of claim 1 is also not disclosed or suggested by Fedyk, and the Examiner makes no assertion that Fedyk teaches this limitation. Since this limitation of claim 1 is not disclosed or suggested by any of the references, Applicant submits that claim 1 is patentable over Rochberger, Wicklund, and Fedyk, taken individually or in combination, for at least this reason.

Each of the independent claims 21 and 33 recites an "identifying" limitation similar to the "identifying" limitation recited in claim 1, except that the source is specified to be an ingress module. Applicant submits that these independent claims are

patentable over Rochberger, Wicklund, and Fedyk for at least the same reasons as those given above in connection with claim 1.

Applicant further submits that dependent claims 9, 32, and 44, which depend from independent claims 1, 21, and 33, and which recite further advantageous aspects of the invention, are likewise patentable over Rochberger, Wicklund, and Fedyk for at least the same reasons as those given above in connection with claims 1, 21, and 33.

In the Office Action, the Examiner rejected claims 105, 107-112, 114, 116, 119-121, 123-128, 130, 132, 135, and 136 under 35 U.S.C. §103(a) as being unpatentable over Rochberger in view of Brice et al. (U.S. Patent No. 4,825,206). These claims have been canceled; thus, Applicant requests that this rejection be withdrawn. In their stead, claims 155-182 have been added. Claims 155-160 and 169-174 claim a method and an ingress module, respectively, for recovering from a failure that occurs within the internal switching fabric of a router, and claims 161-168 and 175-182 claim a method and an ingress module, respectively, for recovering from a failure that occurs to an egress module within a router.

Neither Rochberger nor Brice teaches or discloses a method for recovering from a failure that occurs within a router. As argued previously, the method of Rochberger is applicable to failures that occur between nodes (i.e. routers). There is nothing in Rochberger that discloses that its method may be applied to failures that occur within a node. For example, Rochberger makes no mention of recovering from a failure that occurs within the switching fabric 322 (Fig. 18) of the source node 14, or a failure that

occurs to one of the port interfaces 324, 328 (the egress modules) of the source node 14. Likewise, Brice does not disclose or suggest any method or mechanism for recovering from a failure that occurs within a node. Thus, for at least this reason, Applicant submits that new claims 155-182 are patentable over Rochberger and Brice, taken individually or in combination.

In the Office Action, the Examiner acknowledged that claims 137-154 are allowed. Applicant thanks the Examiner for this acknowledgment.

For the foregoing reasons, Applicant submits that all of the pending claims are patentable over the art of record, including the art cited but not applied. Accordingly, allowance of all pending claims is hereby respectfully solicited.

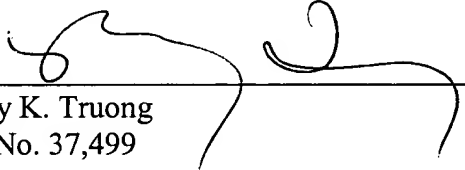
The Examiner is invited to telephone the undersigned at (408) 414-1080 ext. 234 to discuss any issue that may advance prosecution.

If any applicable fee is missing or insufficient, throughout the pendency of this application, the Commissioner is hereby authorized to charge any applicable fees and to credit any overpayments to our Deposit Account No. 50-1302.

Respectfully submitted,

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On 10/4/05 